Innovation Saskatchewan

Annual Report for 2014-15

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Government of Saskatchewan

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Letter of Transmittal and Message from the Board Chair

Her Honour, the Honourable Vaughn Solomon Schofield
Lieutenant Governor of Saskatchewan

May it Please Your Honour:

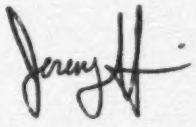
Since its inception, Innovation Saskatchewan (IS) has been providing invaluable direction to the Government of Saskatchewan's innovation agenda. Innovation plays an integral role in growing a strong and diversified economy, which is why it has been identified as a key pillar of the Saskatchewan Plan for Growth; a plan that outlines the priorities for the province's economy moving forward into the year 2020.

During the 2014-15 fiscal year, IS helped advance our province's innovation agenda in a number of ways, including facilitating connections between Saskatchewan research institutes and research and education organizations in Israel, India, China and the UK; assuming responsibility for provincial funding of the Petroleum Technology Research Centre (PTRC) to further encourage innovation in our province's oil and gas sector; and investing in a number of projects that have the potential for significant economic impact and industry advancement.

With Innovation Saskatchewan's leadership, we can continue to increase innovation capacity and expertise in the province, helping enhance Saskatchewan's reputation as a world leading jurisdiction for innovation.

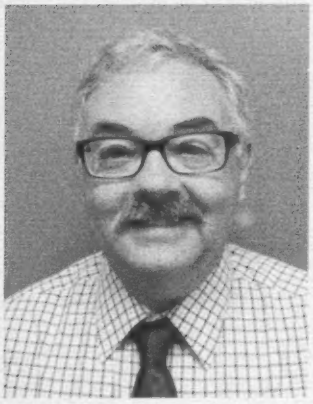
IS is helping build a brighter, more prosperous Saskatchewan for our residents and businesses. We are thankful for the contributions of this agency and its dedication and support in the advancement of innovation in Saskatchewan.

On behalf of IS and the IS Board of Directors, I have the honour to submit herewith the Annual Report of Innovation Saskatchewan, together with the financial statements, for the fiscal year ending March 31, 2015.



Honourable Jeremy Harrison
Minister Responsible for Innovation
Chair of the Innovation Saskatchewan Board of Directors

Letter of Transmittal from the CEO



The Honourable Jeremy Harrison
Minister Responsible for Innovation

Dear Sir:

I have the honour of submitting the Annual Report of Innovation Saskatchewan for the fiscal year ending March 31, 2015. This report has been prepared and carefully reviewed under my direction, and accurately represents the activities and accomplishments of our agency during the past year.

Dr. Jerome Konecsni
Chief Executive Officer
Innovation Saskatchewan

Board of Directors

Innovation Saskatchewan (IS) is led by a Board of Directors who have strong backgrounds in innovation. They collectively have knowledge and experience in the industrial sectors important to Saskatchewan and bring a perspective from inside and outside the province. The board provides oversight and strategic direction to IS. Key in its responsibilities is the hiring and supervision of a Chief Executive Officer to manage the affairs and business of the agency, review/approval of its annual budget, and review/approval of projects seeking funding through funds held by the agency for that purpose.

The members of the Board of Directors of IS are:

Honourable Jeremy Harrison (Chair)
Minister Responsible for Innovation

Honourable Bill Boyd (Vice-Chair)
Minister of the Economy

Mr. Daniel Halyk
President and CEO
Total Energy Services Ltd.
Calgary, AB

Mr. Trevor Thiessen
President
Redekop Manufacturing
Saskatoon, SK

Ms. Pam Haidenger-Bains
Owner
Down to Business
Saskatoon, SK

Mr. Warren Steinley
MLA
Regina Walsh Acres
Regina, SK

Dr. Don Somers
Consultant
Saskatoon, SK

Introduction and Agency Overview

Introduction

This annual report presents activities and results of Innovation Saskatchewan (IS) for the fiscal year ending March 31, 2015. It reports key accomplishments of the agency.

As the Government of Saskatchewan's central agency supporting innovation in the province, IS provides recommendations and advice to the provincial government regarding its strategic direction in the areas of research, development, science and technology, and works directly with industry and other stakeholder groups to encourage the commercialization of technology and increased productivity for economic benefit to the province. It also plays an important co-ordinating role with other ministries and Crown corporations to ensure that policies and priorities across government are aligned with the innovation agenda.

The Innovation Saskatchewan Act was proclaimed on November 2, 2009, and IS began independent operations as an agency on April 1, 2010.

Agency Overview

Innovation Saskatchewan, located at Innovation Place in Saskatoon, is the Government of Saskatchewan's key agency supporting innovation in the province. IS works directly with industry and other stakeholder groups to encourage the commercialization of technology and increased productivity for economic benefit to the province. Under The Innovation Saskatchewan Act, IS has a mandate to:

- Facilitate the co-ordination and strategic direction of the Government of Saskatchewan's support for research and development and science and technology with the objective of fostering the development of new ideas, products and processes to ensure the long-term sustainable growth of Saskatchewan's economy;
- Provide advice and guidance to the Government of Saskatchewan respecting science and technology policy, and to establish, measure, monitor and report on the Government of Saskatchewan's strategies and goals for advancing innovation in the province;
- Co-ordinate and support the establishment and maintenance of science, research and development infrastructure in Saskatchewan;
- Provide recommendations to the Government of Saskatchewan respecting research, development, demonstration and the commercialization of new technologies and innovative processes in Saskatchewan. IS also advises on policies that may better co-ordinate, support, foster, promote and facilitate research, development, demonstration and the commercialization of technology;
- On request of the Lieutenant Governor in Council, to undertake any program or activity for the purposes of achieving the objectives described above; and
- Undertake any other prescribed programs and activities.

Creation of the Innovation Strategy

Background

Innovation can be defined as:

The creation and transformation of knowledge and ideas into new products, processes and services that meet market needs.

In more practical terms, innovation can be viewed as the process of converting knowledge into wealth. To be innovation, new knowledge must be implemented to provide an economic or social benefit.

Mission Statement

On September 28, 2010, the Board of Directors of Innovation Saskatchewan (IS) created the following Mission Statement:

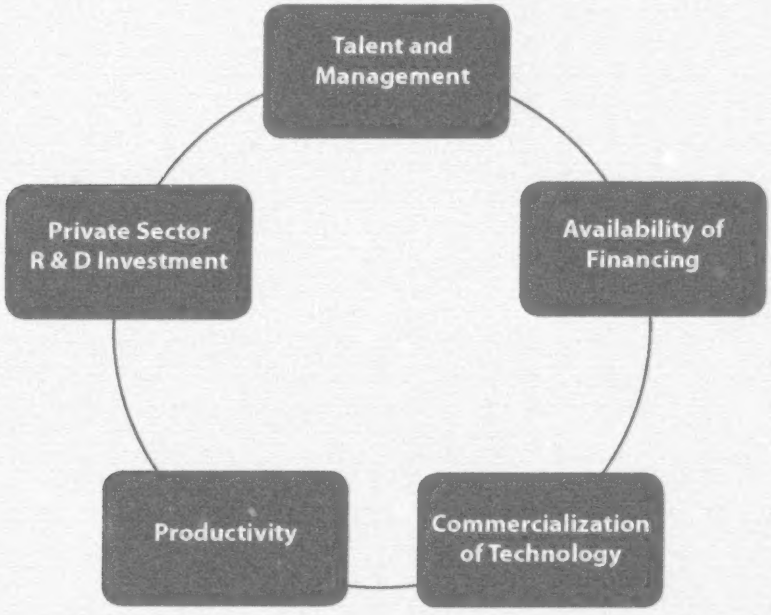
"To be an innovation catalyst serving the needs of individuals, companies and institutions."

Ultimately, the goal of IS is to encourage the existence of sustainable, globally competitive business in the province.

Focus

Government support for innovation in most jurisdictions focuses on two areas – assuring that the environment for innovation exists within the jurisdiction and working to enhance the productivity of companies within the jurisdiction. Many factors influence the provincial innovation system and therefore need to be included in an innovation strategy. These include, among others:

- The financial capacity of Saskatchewan companies to transfer technology, commercialize research or implement new technology in production or service, and the availability of funding or investment;
- The willingness, or lack thereof, by Saskatchewan companies to invest in research and development and the capacity of Saskatchewan companies to integrate new technologies into their existing products, product lines and/or processes;



- Human capital – the need for a skilled workforce and the impact of changing demographics in the workforce, including the management capabilities within Saskatchewan companies; and
- Research, technology transfer and commercialization entities and their capabilities.

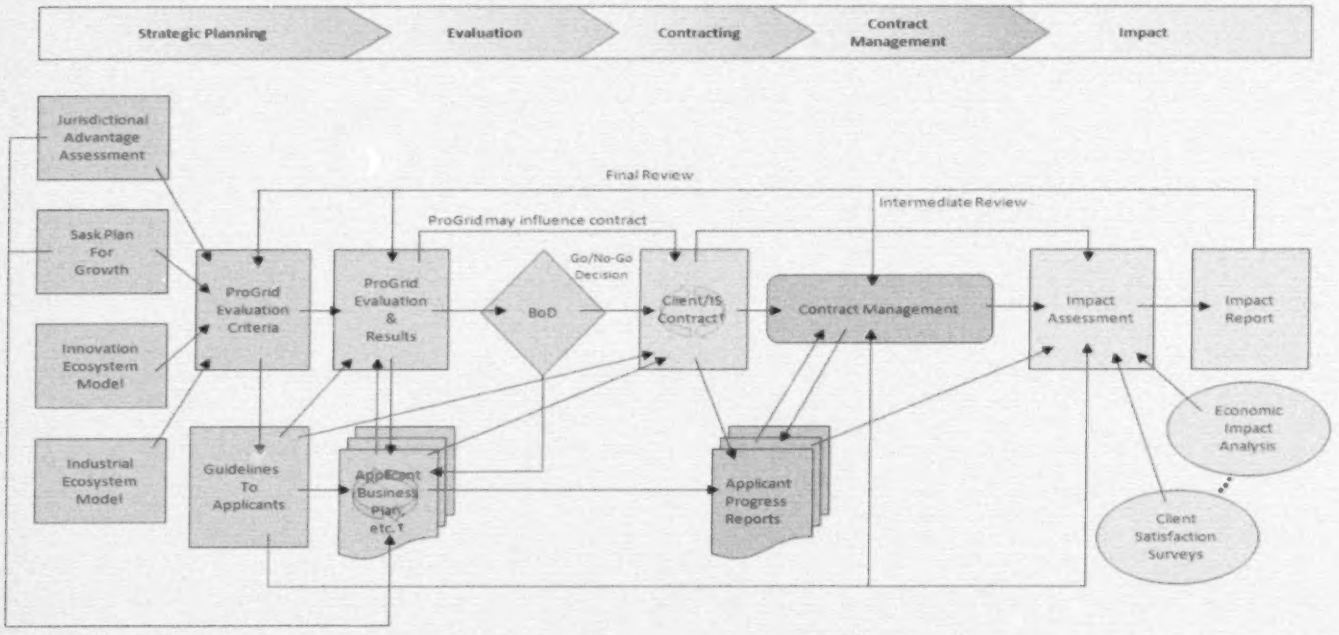
Saskatchewan's Innovation Strategy

Saskatchewan's growing economy is driven largely by its primary natural resource sectors – agriculture, oil and gas, and mining. These three economic engines are driving Innovation Saskatchewan's innovation agenda, with a goal of creating and enhancing sustainable, globally competitive businesses in these sectors. For example, a life science project that develops technology to increase the output from Saskatchewan heavy oil wells would benefit one of the core economic engines of the province, the oil and gas sector, while developing new products or services produced by another sector, agriculture. Focusing on the core economy provides a natural "at home" customer base into which a new technology can be launched. Once proven, it can be extended to new markets outside the province. New product development focused on serving Saskatchewan's key economic drivers, where Saskatchewan has a natural advantage, is much more likely to be sustainable in the marketplace.

Project Management Roadmap

Innovation Saskatchewan has developed a Body of Practice, described in its Project Management Roadmap, which enhances IS's ability to evaluate opportunities, manage contracts and measure impact. It provides a means of accountability for IS investments, while creating a continuous improvement model, allowing IS to become more efficient and accountable, learning from prior experience. An overview of the diagram is shown below.

The process begins with establishment of the strategic objectives IS seeks to achieve through its investments, as described in the Jurisdictional Advantage Assessment, the Saskatchewan Plan for Growth, and our understanding of the environment necessary to encourage innovation in the province. Together, these inform the criteria to be used in evaluating project proposals. IS uses ProGrid to evaluate projects and programs. ProGrid is a methodology for evaluating opportunities that involves tangible and intangible factors that are important to a funding agency. The IS version of ProGrid enables the evaluation of a project or program with respect to its alignment with provincial priorities, the strength of the project's design, including plans to implement findings to benefit the province, and impact those benefits will have on the province. Project proponents are informed of the criteria and a lead person within IS works with the proponent to understand and, if necessary, refine the proposal to align with these criteria.



Once a project is approved internally, it is recommended to the IS Board of Directors. Subsequent to board approval, the IS lead begins discussion of contract details with the proponent, based on an established contract template. The contract reflects the timelines, deliverables, milestones, reporting, payment schedules, and other details agreed to by the proponent during earlier discussions. IS manages the project according to this contract over its lifetime.

Upon completion of the contract, an analysis is done to determine whether IS achieved the stated objectives or had the desired outcomes from the investment. IS then performs an evaluation of the outcomes and impacts. The impact analysis and report form a cycle of continuous improvement feedback, which informs ongoing relations with the client, while providing information that may be used to improve IS's contract management and project evaluation methods. It may also provide insight into the design of the underlying strategy.

Progress in 2014-15

Saskatchewan Advantage Innovation Fund (SAIF)

Innovation Saskatchewan makes strategic innovation investments through its Saskatchewan Advantage Innovation Fund (SAIF). Projects need to be aligned with provincial priorities and have the potential to create significant economic impact. The range of projects that have received funding through SAIF have varied from activities that are fairly far upstream, near the research end of the spectrum, to development work very near to the commercialization stage. Common to all initiatives is significant investment and involvement by industry, and a clear path to implementation of the results of the funded work.

The development of SAIF projects is time consuming. It begins with opportunity identification; moves to assembling a team of user company(ies), technology development company(ies) and research organizations; then to the creation, evaluation and modification of a proposal; and finally to approval and contracting stages. A diagram of the SAIF pipeline from its inception to March 2015 is shown on page 13.

IS began the 2014-15 fiscal year with $3,147,000 in SAIF. This was a combination of $2,550,000 budget allocation plus $597,000 carried forward from previous years. As the following table illustrates, IS's board approved initiatives that committed $2,510,000 in 2014-15, leaving $637,000 available for future projects.

Initiative	2014-15 Funds Available ($1000s)	Status	Funds Committed ($1000s)	Carry Forward ($1000s)
International Minerals Innovation Institute (IMII)	1,000	Board approved, Funds transferred	1,000	0
Enhanced Oil Recovery (EOR) R&D	1,000	Board approved, 1 EOR project	160	840
Innovation Skills Capacity Development Program	350	Board approved, project 80% complete	350	0
International Engagement & Investment Attraction	200	Board approved plus $100, project 80% complete	300	-100
SUB-TOTAL 2014-15 SAIF BUDGET	**2,550**			
Carry Forward from previous years	597			597
Avalon Rare Earth Elements Phase 1		Board approved, project 50% complete	100	-100
Genome Prairie		Board approved, project to start in 2015-16	600	-600
TOTALS	**3,147**		**2,510**	**637**

SAIF Project Details

The International Minerals Innovation Institute (IMII) was created in 2012 as a collaboration among industry, government, and education and research institutions to address the need for education programs and research projects focused on industry-expressed needs. Since its inception, $2.7 million has been invested in IMII from SAIF (including $1.0 million in 2014-15), which is addressing the Saskatchewan Plan for Growth goal of "fully implementing the IMII." In the same period, industry has invested $3.4 million and has committed an additional $5.4 million in 2014. IMII's industry members are Agrium, BHP Billiton, Cameco, K+S Potash, Mosaic, North Rim Exploration and PotashCorp.

To date, the IMII has approved $6.6 million for seven education and training initiatives and two research and development projects and has granted conditional approval to two more research and development projects, costing $2.6 million. These investments have leveraged an additional $4.5 million from other sources. Projects are being delivered by the University of Saskatchewan, Saskatchewan Polytechnic and four colleges (Northlands, Parkland, Carlton Trail, and Cumberland). Proposals from other Saskatchewan institutions are under consideration.

Carbon Capture, Utilization and Storage (CCUS) was allocated $500,000 in the 2013-14 budget to assist in the re-orientation of CCUS research and development organizations located at the University of Regina in support of the Saskatchewan Plan for Growth goal stating "Saskatchewan will remain an international leader in the development and demonstration of carbon capture and storage technology." IS chairs a committee of SaskPower and Ministry of the Economy representatives (CCUS-SK Committee) to ensure alignment of the province's investments in CCUS research with the provincial CCUS priority as articulated in the Plan for Growth.

The CCUS-SK Committee recommended, and the IS board approved, that the SAIF allocation for CCUS be used to support the following two initiatives:

1. CCUS Control System Training Equipment: $100,000 was provided to the University of Regina to fund the acquisition of CCUS control system training equipment to enable the launching of a CCUS control systems class. SaskPower provided in-kind support of at least $100,000 and will support the initiative financially in the longer term. This project was successfully completed in 2014-15, and the new laboratory at the University of Regina is now providing training for both university students and industry-employed personnel.
2. Technology Management Initiative: $400,000 was provided to the University of Regina to pay for three individuals from the university (a project support engineer, a computation chemist and an experimental chemist) to work primarily on SaskPower sites to structure and organize technical information emanating from CCUS initiatives both in Saskatchewan and from projects under development in other regions to fill in knowledge gaps and improve the technology. The deliverable will be information that will inform decisions regarding the use CCUS technology for to Boundary Dam Units 4 and 5. The work was 75 per cent complete at the end of 2014-15.

Enhanced Oil Recovery (EOR) Research and Development is an initiative put forward to encourage research into new ways of increasing oil production prompted by the fact that of Saskatchewan's estimated 48.3 billion barrels of Original Oil in Place (OOIP), 87 per cent cannot be recovered with known technologies. Of the 13 per cent OOIP considered recoverable, 10.5 per cent has been extracted, leaving only 2.5 per cent that can be recovered with existing technologies. SAIF has been allocated $2.0 million ($1.0 million in each of 2013-14 and 2014-15 fiscal years), from which five EOR projects have been approved and are in various states of progression.

A brief summary of the EOR projects completed and underway follows:

1. EOR-1: Mapping of In-Reservoir Oil Flow: The second phase of a multi-phase project continued in 2014-15. The project is designed to develop the technology needed to map the flow of oil in reservoirs, particularly those that have been subjected to the extraction process known as Cold Heavy Oil Production with Sand (CHOPS) that has been widely used in Saskatchewan's heavy oil fields. CHOPS involves the deliberate production of sand along with the oil it contains. Since after seven or eight years of production, wells produce mainly water rather than oil, it is theorized that channels (worm holes) have been created that become a preferential path for the injected recovery fluids (water), resulting in the recovery fluids no longer coming into contact with the oil that remains in the formation. Being able to map wormholes will allow:
    - Placement of new in-fill wells that avoid intersecting wormholes to access oil that is not on the wormhole path; and
    - Improved design of new enhanced oil recovery technologies.

    Deliverables in this project that are expected to be complete in 2015-16 include:

- Field injection and transmission of blank motes to better understand transmission probability in relation to mote size;
- Field injection of imaging sensors and/or fluorescent blank motes and retrieval of optical data and/or Radio-Frequency Identification (RFID) data to acquire geometric information of wormhole entrances in the wellbore area to increase understanding of mote diffusion;
- Flow loop testing to determine position resolution and accuracy based on inertial navigation;
- Evaluation of motes capable of logging temperature and pressure as a function of time via their use in field injection experiments; and
- A report compiling the findings of the work undertaken, conclusions regarding the feasibility of using motes to map wormholes and their structural characteristics and the identification of future steps required to commercialize the technology.

2. EOR-2: Radio Frequency (RF) Heating EOR: SAIF support is for Phase 1 of a two-phase project designed to assess the potential of RF heating as an EOR technology in Saskatchewan's heavy oil. RF heating technology holds considerable potential for volumetrically heating heavy oil formations and mobilizing hydrocarbons. Dielectric (RF) heating works by volumetrically exciting bipolar molecules and instantaneously heating a volume. This technology holds promise for reservoir heating due to both its instantaneous properties, and the ability to reach out many metres. Deliverables in Phase 1, which were completed in 2014-15, include:
   - Reservoir model analysis and report;
   - Mechanical concepts conceptual design presentation package;
   - Antenna conceptual design including results of modelling and simulation;
   - Product development baseline;
   - Business model based on single well economic model; and
   - Report including analysis and recommendations regarding proceeding to Phase 2, field demonstration.

   Upon review of the results of Phase 1, the industry participants concluded that the technology lacked the economic viability needed to proceed to invest in Phase 2.

3. EOR-3: Microbially Generated Biosurfactants for Heavy Oil EOR: The project is focusing on the stimulation of naturally occurring biosurfactant-producing microbes and testing of those biosurfactants in heavy oil reservoirs to enhance oil recovery (EOR). The project team includes a technology provider, an oil company, Saskatchewan Research Council (SRC), the University of Saskatchewan and the National Research Council (NRC). The project is the initial project within an iterative program of developing a biosurfactant approach to heavy oil enhanced recovery. This project is expected to:
   - Isolate and identify DNA sequences consistent with biosurfactant and biopolymer-producing bacteria and archaea indigenous to the reservoir from downhole samples taken from a range of wells in the reservoir;
   - Conduct chamber trials to optimize nutrient mixtures to maximize production of surfactants in situ for those indigenous biosurfactant producers found;
   - Conduct DNA testing to determine impact of introducing a foreign bacteria or non-indigenously produced biosurfactant into the reservoir;
   - Subject resulting biosurfactants to modelling and bench-testing to determine characteristics (interfacial tension, PVT fluid analysis, sandpack and coreflood studies) to test the effectiveness of the surfactant in model reservoir conditions;
   - Assess the performance of the best surfactants for scale-up and use in field test in heavy oil reservoir;
   - Deliver those biosurfactants found meeting the criteria for success in the field to the project's oil company partner for field testing; and
   - Compile findings into a report.

   The lab work on this project is proceeding as planned and is being expanded due to increased investment from NRC based on early results. Four microbial-based and one plant-based surfactants will be provided to SRC for simulated field testing. Unfortunately, the field work portion of the project has been delayed until oil prices recover.

4. EOR-4: Oil Cut Meter Development: This project, led by an instrument manufacturer with support from its distributor, SRC and an oil company, will address a challenge faced by most producers of conventional oil – that of being able to cost effectively measure

the amount of oil produced at the well head. As wells mature, they produce less and less oil and more and more water. The majority of conventional wells produce fluids that contain less than 5 per cent oil. To address the inability to measure individual well oil production, companies pool the fluid from a number of wells – some of which produce 100 per cent water and no oil. Removing the "water producers" saves the production and water handling costs associated with those wells and frees battery capacity to take on suspended wells that were taken offline in times of lower prices.

The project, set to begin in early 2015-16, will develop and test an affordable meter that will address the wide variety of conditions that it will encounter in the field. The sub-system prototypes and the assembled product will be tested during the development process with actual oil and water mixtures of varied gravity, density, temperature, chemical composition and presence of sand or entrained air. The project will deliver an instrument capable of measuring the amount of oil in the fluid produced at each well at an affordable price point.

5. EOR-5: Understanding the Formation of Foamy Oil: This project, also set to begin in early 2015-16, will take advantage of the capabilities of the Canadian Light Source (CLS) at the University of Saskatchewan to "visually observe" and better understand the formation of foamy oil that is known to play an important role in the heavy oil recovery process. The knowledge gained will be used by University of Calgary researchers and the Petroleum Technology Research Centre's consortium of heavy oil producers to improve their process modelling to more accurately represent the physical phenomenon. This will lead to better control of the process parameters delivering improved recovery without investment in new capital equipment, an ideal project for times of lower prices.

Rare Earth Elements(REEs)

An Ontario company that owns a REE deposit in the Northwest Territories has engaged the Saskatchewan Research Council (SRC) to conduct the laboratory work required to demonstrate proof of concept for a new separation process to reduce the amount of reagents used by 30 per cent. IS facilitated the project by providing funding for 25 per cent of the cost from SAIF. If the process proposed by SRC is successful, it could result in the company establishing a REE processing facility in Saskatchewan that could employ 300 people, create a substantial market for a Saskatchewan-based reagent manufacturer, and open opportunities to exploit Saskatchewan REE deposits.

Innovation Skills and Capacity Development Program (ISCDP)

Innovation Saskatchewan has developed programming to support innovation skills and capacity development in Saskatchewan's industries. The program will deliver information sessions, detailed innovation enhancement workshops, and innovation capacity diagnostics that will provide companies with the capability to enhance their competitiveness. The targets for this program are workers in Saskatchewan's core sectors and their supply chains, with the objective of diversifying the economy, supporting the Saskatchewan Plan for Growth, alleviating the skill shortage and increasing profitability and performance of organizations.

The ISCDP draws heavily on a tool developed by Dr. Brooke Dobni of the Edwards School of Business at the University of Saskatchewan. The approach was developed with the knowledge that innovation can be scientifically measured and systematically managed. Dr. Dobni works with organizations that desire to become industry leaders and help others make the transition to sustainable innovation cultures. The targeted goals of implementing the innovation tool are to help companies create new value, assess core competencies, illuminate perspectives, challenge current practices and processes, and ignite innovative cultures.

Dr. Dobni's tool was used to measure the innovation health of Saskatchewan companies. The result was a rating of 69, which is equal to the average score obtained by Fortune 1000 companies. Ultimately, the ISCDP aims to increase the Innovation Health Index from 69 to 72 by 2020. The program will achieve this goal by supporting and facilitating the growth of the core sector supply chains and the enabling sectors as well as supporting the Manufacturing Centre of Excellence. Organizations supporting the program to meet this objective include the Industrial Research Assistance Program (IRAP), ministries of Agriculture and the Economy, industry associations, Saskatchewan companies and other organizations within the province.

In 2014-15, seven training sessions were delivered and three companies entered into a more extensive diagnostic process to help design a path to increase innovation at the firm level.

In addition, the program helped support a number of innovation-oriented events including the Manning Awards, Agricultural Biotech International Conference, Saskatchewan Chamber of Commerce's ABEX Awards, Raj Manek Foundation, Saskatchewan Science Centre and the development work around a major international conference being attracted to Saskatchewan – STEMFEST (Science, Technology, Engineering and Math Festival) – that targets increased interest in STEM skills from youth.

Provincial Support for Genome Prairie

Genome Prairie is a non-profit organization that supports stakeholders across Saskatchewan and Manitoba in capturing and maximizing the benefits of advanced research in genomics and related biosciences. Genome Prairie will have a facilitative role in the launch of the Canadian Plant Genomics Platform, which will be designed to augment a number of plant-based technologies under development. These include transformation, double haploid development and plant imaging. Genome Prairie will also work in the mining and minerals sector, looking at biological systems and metagenomics for remediation of tailings ponds.

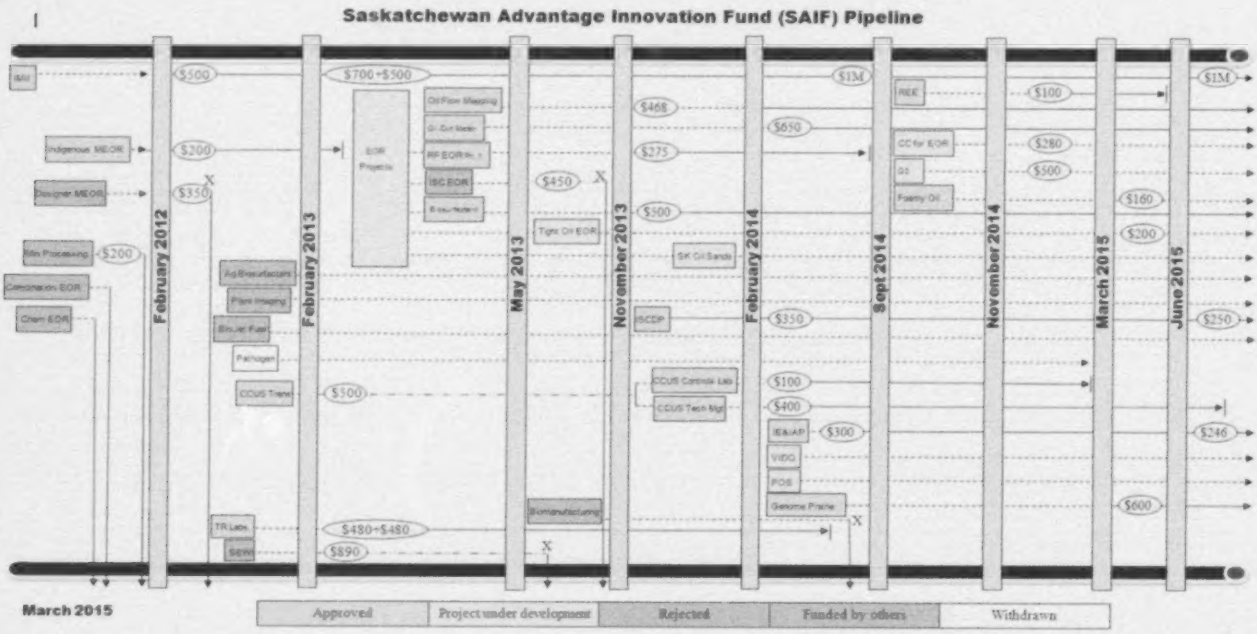
International Engagement and Investment Attraction Program (IE&IAP)

IE&IAP focused its efforts on four countries in 2014-15:

1. Israel – where Innovation Saskatchewan entered into a joint funding agreement with the Canada-Israel Industrial Research & Development Foundation (CIIRDF). CIIRDF worked with four Saskatchewan intermediaries (International Minerals Innovation Institute, Petroleum Technology Research Centre, Fedoruk Centre and the Global Institute for Food Security) to identify industrial and research needs. With this information, CIIRDF searched out researchers and technology companies in Israel that have potential to address the identified needs. With this foundational work completed, CIIRDF will bring Israeli experts to round tables in Saskatchewan in 2015-16 to attempt to connect researchers and technologies with applications in Saskatchewan's industries.
2. India – IE&IAP personnel identified opportunities for India-Saskatchewan collaboration in agriculture and water technologies. Letters of Interest were signed with organizations in Punjab and Tamil Nadu, and further market development work was done on behalf of a Saskatchewan waste water processing company.
3. China – IE&IAP assisted the University of Saskatchewan's VIDO-InterVac in the initial exploration and development of a business plan for approaching an opportunity to provide vaccines to China's hog industry. The opportunity could result in technology licensing, small-scale manufacturing and Chinese investment in Saskatchewan.
4. United Kingdom – IE&IAP is supporting Saskatchewan researchers in collaborating with a number of institutions in the UK in areas including plant root imaging, wheat research and swine health for the mutual benefit of expanding research programs in the UK and Saskatchewan.

SAIF – Past, Present and Future

The following diagram – The SAIF Pipeline – illustrates the history of SAIF, which includes projects that were proposed, evaluated and rejected; projects that were proposed, evaluated and funded; and projects that are still in various stages of evaluation.



Saskatchewan's Integrated Nuclear Research and Development Strategy

In 2011, the Government of Saskatchewan committed $57 million in funding over seven years, under the province's Integrated Nuclear Research and Development Strategy, for the following initiatives:

- Installation of Saskatchewan's first PET/CT (Positron emission tomography computed tomography) scanner at the Royal University Hospital in Saskatoon;
- Construction of a Cyclotron facility at the University of Saskatchewan to be used for research and development, as well as to produce medical isotopes used by the PET/CT;
- Formation of the Sylvia Fedoruk Canadian Centre for Nuclear Innovation;
- Research into the use of linear accelerators for the production of molybdenum99 for medical diagnosis; and
- A Memorandum of Understanding with Hitachi-GE Nuclear Energy, Ltd. and associated companies for joint research into areas of nuclear technology and safety.

Responsibility for management of these initiatives was assigned to IS. Since the approval of the Integrated Nuclear R&D Strategy, IS has successfully managed all of these projects.

PET/CT Facility at the Royal University Hospital in Saskatoon

The PET/CT scanner began operating in May 2013. While the scanner will be used primarily to provide diagnostic care for Saskatchewan patients, it will also be used as a medical research tool. In 2012, IS provided $4 million toward the purchase cost of $6 million.

Establishment of Research Cyclotron

The capital project for construction of this $25.5 million facility, which includes a new cyclotron, research centre and nuclear substances laboratory, began in June 2013. Traditional construction of the facility was completed in December 2014, after which commissioning and nuclear licensing began. The first isotopes for experimental use are expected in 2015, following regulatory approval of the facility. By 2016, after approval by Health Canada of the medical isotopes produced for use in humans, the cyclotron will produce medical isotopes for Saskatchewan's PET/CT facility.

The cyclotron and related laboratories are owned by the University of Saskatchewan and operated under licence by the Fedoruk Centre and will support activities under the Integrated Nuclear R&D Strategy, including research on new isotopes for human, animal and plant health applications, and the use of cyclotrons for industrial purposes.

The Sylvia Fedoruk Canadian Centre for Nuclear Innovation

The Fedoruk Centre began operation in 2012. IS is providing a total $30 million over seven years to invest in nuclear research focused on nuclear medicine, materials science, improving nuclear energy systems including small modular reactors and reactor safety, and the relationship between the nuclear domain and environment and society.

The Fedoruk Centre will operate the cyclotron facility under an agreement with the University of Saskatchewan. IS is providing an additional $1 million per year for three years to support the costs.

Since 2012, the Fedoruk Centre has granted over $3.7 million to 25 nuclear research projects, with a total value of close to $7.7 million when combined with matching funds and in-kind contributions. In October 2014, the Fedoruk Centre announced a $5.2 million investment to establish a nuclear imaging program in the province, consisting of three Fedoruk Chairs: two at the University of Saskatchewan and one at the University of Regina; the funds are for research infrastructure and training. The research leaders who will be recruited for the Chairs will be instrumental in shaping the development of the Saskatchewan Centre for Cyclotron Sciences, which is operated by the Fedoruk Centre.

Canadian Light Source (CLS) Research on Commercial Production of Medical Isotopes

The Government of Saskatchewan, through Crown Investments Corporation, provided $2 million in funding to the CLS for equipment to study the production of molybdenum99 using a linear accelerator, matching the Government of Canada's $10 million contribution. The new CLS linear accelerator has successfully produced medical isotopes and the CLS, along with its research partners, are working on commercialization of the technology.

Hitachi Ltd. Nuclear Research Partnership

Funding of $5 million over five years (2013 to 2018) was committed by the province, and matched by Hitachi in-kind/cash of $5 million, to conduct nuclear research in partnership with Saskatchewan-based research institutions. Research will focus on nuclear technology, nuclear safety and small modular reactors as agreed to in a Memorandum

of Understanding (MOU) signed in 2011 by Hitachi and its partner companies and the Province of Saskatchewan.

The University of Saskatchewan and Hitachi have negotiated an agreement for work totalling $1.2 million. This agreement covers five individual projects, all looking at how excess thermal energy from a Small Modular Reactor (SMR) could be used for purposes such as district heating, water desalination and greenhouse operation. The agreement received final signatures on January 23, 2014, and the work will be carried out over 30 months from that effective date.

Petroleum Technology Research Centre

In 2014-15, the Government of Saskatchewan transferred the responsibility for provincial funding of the Petroleum Technology Research Centre (PTRC) to Innovation Saskatchewan. This transfer promoted synergies between this petroleum-focused innovation intermediary and Innovation Saskatchewan's goal to encourage innovation through the Enhanced Oil Recovery (EOR) element of its Saskatchewan Advantage Innovation Fund (SAIF). IS entered into and managed a contract for $2.0 million with the PTRC. IS's Chief Strategist assumed a position on the PTRC's Board of Directors and on its Technical Advisory Group (TAG), along with industrial members, to provide oversight on how this provincial funding would be used to benefit the province's oil and gas sector. $1.2 million of the IS funding, supplemented with $0.5 million from industry memberships, was invested in TAG-directed research that investigates the behaviour of heavy oil in reservoirs. $0.8 million was used to support the overall operations of PTRC. The following table outlines details on the projects funded:

Restoration of Foamy Oil in Depleted Post-CHOPS Reservoirs	University of Calgary	$196,629	2 Years
Scale-Up of Dispersivity in Post-CHOPS Solvent Injection Processes	University of Alberta	$57,120	2 years
Integrating a Coalescer Column Within a Treater to Resolve Tight EOR Water and Oil Emulsions	Saskatchewan Research Council	$149,700	1 Year
3D Physical Model Tests to Investigate the Effect of Wormhole Location in a Cyclic Solvent Injection (CSI) Process	Saskatchewan Research Council	$184,000	1 Year
Recovery Mechanism Investigation of Variable VRR Waterflood Processes:3D Modelling of Heterogeneous Reservoirs (Baseline)	Saskatchewan Research Council	$180,800	1 Year
Solvent Solubility Prediction-Extension to CO2	Saskatchewan Research Council	$143,200	1 Year
Produced Emulsions from Chemical Flooding- Characterization and Demulsification	Saskatchewan Research Council	$117,600	1 Year
Polymer (P) and Surfactant-Polymer (SP) EOR for Heavy Oil Fields	Saskatchewan Research Council	$166,400	1 Year
Non-Equilibrium Phase Behaviour of Solvent(s)-Heavy Oil Systems Under Reservoir Conditions	University of Regina	$150,000	2 Years
Role of Propane and Methane in Enhancing the Foamy Oil Phenomenon and Performance of Cyclic Solvent Injection, CSI (Huff and Puff) in Post-CHOPS Reservoirs	University of Regina	$150,000	2 Years
Measurements of Solvent Diffusion Coefficients in Heavy Oil Without and With Porous Media	University of Regina	$40,000	1 Year
Heavy Oil Waterflooding Post Cyclic Solvent Injection (CSI)	University of Regina	$40,000	1 Year
Non-Equilibrium Phase Behaviour Study of Heavy Oil-Solvent System Under Bulk Systems	University of Regina	$143,000	2 Years
TOTAL		**$1,718,449**	

Global Institute for Food Security

The Global Institute for Food Security (GIFS) is an excellent fit with current government priorities of investing in innovation and knowledge economy to create sustainable growth. This new research institute was announced in December 2012 with funding of $35 million from Potash Corp and $15 million from the Government of Saskatchewan. GIFS represents an innovative approach to research and development that will address the increasing global demand for safe, nutritious and reliable food.

GIFS, located at the University of Saskatchewan, has a mandate to contribute solutions to the global food and nutrition challenge while also adding to the growth and sustainability of the Saskatchewan economy. The institute aims to engage in discovery that will lead to transformational increases in food crop productivity – in yields, environmental sustainability, profitability and resiliency in the face of changing weather, diseases and pests, and changing markets and consumer preferences.

In its first year, GIFS initiated programs and partnerships that have begun to meet the ambitious goals in addressing the global challenge of food security:

- Investments have been made in research that will advance the goals of the provincial economic growth plan, goals that include increasing agricultural production and GDP, and positioning Saskatchewan as a global biosciences leader;
- Partnerships have been identified with other research institutions in North America, Europe, Africa and Asia that will ensure the impact of GIFS's research is felt globally; and
- Unique opportunities have been identified for interdisciplinary science and research at the University of Saskatchewan and in partner research institutions, paving the way for talented students and researchers to engage in transformative research.
- Dr. Maurice Maloney joined GIFS as CEO in October 2014. He worked with the research community, industry and government to establish areas of focus, recruit key scientific personnel and establish strategic partnerships. IS supported GIFS and the Ministry of Agriculture in facilitating partnerships and identifying funding opportunities.

Board Representations

The Government of Saskatchewan was represented by Innovation Saskatchewan on the following boards of directors:

- International Minerals Innovation Institute (IMII) **www.imii.ca**
- Sylvia Fedoruk Canadian Centre for Nuclear Innovation **www.fedorukcentre.ca**
- The Canadian Light Source (CLS) **www.lightsource.ca**
- Saskatchewan Research Network (SRnet) **www.srnet.ca**
- Saskatchewan Health Research Foundation (SHRF) **www.shrf.ca**
- Vaccine and Infectious Disease Organization – International Vaccine Centre (VIDO-InterVac) **www.vido.org**
- Petroleum Technology Research Centre (PTRC) **www.ptrc.ca**
- Agricultural Bioscience International Conference (ABIC) **www.ABIC.ca**

External Committees

In 2014-15, Innovation Saskatchewan represented the Government of Saskatchewan on the following external committees:

Provincial/Territorial Ministers Responsible for Innovation

Responsibility to chair this committee has been handed to Newfoundland and Labrador. Both a Deputy Minister level committee and a working group support the ministers. There was no significant activity in 2014-15, although Newfoundland and Labrador has indicated that they expect to call a Working Group meeting early in the 2015-16 fiscal year.

Pacific NorthWest Economic Region (PNWER)

Innovation Saskatchewan participates as Saskatchewan's member of PNWER's Innovation and Technology Working Group. This has led to a framework for enhanced regional economic development and the creation of an Innovation Assets Inventory for the PNWER region. More recently, the Innovation Working Group has assisted other PNWER working groups with the incorporation of innovation tools into their programs.

Natural Sciences and Engineering Research Council of Canada (NSERC) Prairies Advisory Committee

Innovation Saskatchewan is a member of NSERC Regional Offices Advisory Committee. The mandate of this advisory committee is to provide advice on how NSERC can enhance academic-industry partnerships in research, innovation and advanced training. It provides input on the offices' activities and priorities, particularly efforts to strengthen collaboration between post-secondary institutions and the private sector. It also provides opportunities to exchange information, build consensus and enhance collaboration between post-secondary institutions, the private sector, federal and provincial departments and other organizations active in regional innovation systems.

International Minerals Innovation Institute (IMII) Panels

The IMII has two industry majority panels that convey individual company needs for enhanced education and training and research and development. Panel members (company, institutional and governmental representatives) consider options for solutions to the identified needs. Finally, a subset of the panels (the industry and government funders) decide if an acceptable path forward has been agreed upon, and make recommendations to the board for project funding approval. IS represents the government's interests on both these panels and serves on its board.

Canadian International Food Security Research Fund – Department of Foreign Affairs, Trade and Development (DFATD)

Innovation Saskatchewan's CEO was asked to serve on the Governance Committee of the $60 million fund administered by International Development and Research Centre (a division of DFATD) to fund projects in the area of food security in developing countries. The committee approves projects submitted by universities across Canada.

The Petroleum Technology Research Centre (PTRC) Technical Advisory Group

The PTRC requests proposals from the Saskatchewan Research Council, the University of Regina and other institutions with relevant expertise to address issues important to industry members of the PTRC. Successful proposals are to be funded with a combination of IS's investment in the PTRC and industry membership fees. Decisions as to which projects to fund are made by the Technical Advisory Group, which includes one representative from each industry member and one representative from IS.

For more information

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Tel: (306) 933-7205
Fax: (306) 933-5320

2014-15 Financial Overview

Innovation Saskatchewan

Report of Management

for the Twelve Month Period Ended March 31, 2015

The accompanying financial statements are the responsibility of the management of Innovation Saskatchewan. They have been prepared in accordance with generally accepted accounting principles for the public sector, using management's best estimates and judgments, where appropriate. Management is responsible for the reliability and integrity of the financial statements, the notes to the financial statements and other financial information contained in this report. Management is also responsible for maintaining a system of internal controls, policies and procedures designed to provide reasonable assurance that assets are safeguarded and that accounting systems provide timely, accurate and reliable financial information.

The Innovation Saskatchewan Board of Directors is responsible for ensuring that management fulfills its responsibilities for financial reporting and internal control. The Office of the Provincial Auditor has audited the agency's financial statements in accordance with generally accepted auditing standards and their report follows.

Dr. Jerome Konecsni
Chief Executive Officer
Innovation Saskatchewan

July 24, 2015

Innovation Saskatchewan

Financial Statements

For the year ended March 31, 2015

PROVINCIAL AUDITOR
of Saskatchewan

INDEPENDENT AUDITOR'S REPORT

To: The Members of the Legislative Assembly of Saskatchewan

I have audited the accompanying financial statements of Innovation Saskatchewan, which comprise the statement of financial position as at March 31, 2015, and the statements of operations and accumulated surplus, change in net financial assets, and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian public sector accounting standards for Treasury Board's approval, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with Canadian generally accepted auditing standards. Those standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Opinion

In my opinion, the financial statements present fairly, in all material respects, the financial position of Innovation Saskatchewan as at March 31, 2015, and the results of its operations, changes in its net financial assets, and its cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Judy Ferguson

Regina, Saskatchewan
July 17, 2015

Judy Ferguson, FCPA, FCA
Provincial Auditor

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Statement 1

Innovation Saskatchewan
Statement of Financial Position
As at March 31

	(thousands of dollars) 2015	2014
Financial Assets		
Due from General Revenue Fund (Note 3)	$ 5,129	$ 9,794
Accounts Receivable	12	45
	5,141	9,839
Liabilities		
Accounts Payable and Accrued Liabilities	344	545
Net Financial Assets (Statement 3)	4,797	9,294
Non-financial Assets		
Prepaid Expenses	8	16
Accumulated Surplus (Statement 2)	$ 4,805	$ 9,310

Designated Assets (Note 9)
(See accompanying notes to financial statements)

Statement 2

Innovation Saskatchewan
Statement of Operations and Accumulated Surplus
for the Year Ended March 31

		(thousands of dollars)	
	Budget (Note 4)	***2015*** **Actual**	***2014*** **Actual**
Revenue			
Transfer from the General Revenue Fund	$ 11,590	$ 11,590	$ 28,006
Interest		96	140
Other		239	63
	11,590	11,925	28,209
Expenses (Note 7)			
Administration	2,320	1,938	2,615
Program Grants			
Nuclear Strategy	4,720	10,218	18,308
SAIF (Note 9)	2,550	2,206	2,110
PTRC	2,000	2,000	-
Other	-	68	552
	11,590	16,430	23,585
Annual (Deficit)/Surplus	$ -	(4,505)	4,624
Accumulated Surplus, Beginning of Year		**9,310**	**4,686**
Accumulated Surplus, End of Year (Statement 1)		$ 4,805	$ 9,310

(See accompanying notes to financial statements)

Statement 3

Innovation Saskatchewan
Statement of Change in Net Financial Assets
for the Year Ended March 31

	(thousands of dollars) 2015	2014
Annual (Deficit)/Surplus	$ (4,505)	$ 4,624
Decrease/(Increase) in Prepaid Expenses	8	(15)
(Decrease)/Increase in Net Financial Assets	(4,497)	4,609
Net Financial Assets, Beginning of Year	9,294	4,685
Net Financial Assets, End of Year (Statement 1)	$ 4,797	$ 9,294

(See accompanying notes to financial statements)

Statement 4

Innovation Saskatchewan
Statement of Cash Flows
for the Year Ended March 31

	(thousands of dollars)	
Operating Activities	**2015**	**2014**
Cash Receipts from General Revenue Fund	11,590	28,006
Cash Receipts from Other Operating Activity	244	63
Cash Paid to Suppliers and Employees	(16,631)	(23,690)
Cash (Used in) Provided by Operating Activities	(4,797)	4,379
Investing Activities		
Cash Receipts from Interest	132	110
Cash Provided by Investing Activities	132	110
(Decrease)/Increase in Due From General Revenue Fund	(4,665)	4,489
Due from General Revenue Fund, Beginning of Year	9,794	5,305
Due from General Revenue Fund, End of Year	$ 5,129	$ 9,794

(See accompanying notes to financial statements)

1. Status of Innovation Saskatchewan

Innovation Saskatchewan was established under the provisions of *The Innovation Saskatchewan Act.*

Innovation Saskatchewan is the central agency of the Government of Saskatchewan with responsibility for implementing Saskatchewan's innovation priorities. Innovation Saskatchewan coordinates the strategic direction of the government's research and development and science and technology expenditures; provides advice on science and technology policy; coordinates the establishment and maintenance of science, research and development infrastructure; and provides advice and recommendations on research, development, demonstration, and the commercialization of new technologies and innovative processes in Saskatchewan. Innovation Saskatchewan is a corporate body eligible to receive monies primarily appropriated by the legislature for these purposes.

2. Significant Accounting Policies

These financial statements are prepared using Canadian Public Sector Accounting Standards published by CPA Canada and reflect the following significant accounting principles. Innovation Saskatchewan did not have any re-measurement gains and losses, therefore a statement of re-measurement gains and losses is not provided.

a) Revenue

Revenue is recognized in the period in which the transactions or events occurred that give rise to the revenue. Transfers from the General Revenue Fund are unrestricted in nature and are recognized when authorized and any eligibility criteria are met.

b) Expenses

Expenses represent the cost of resources consumed during the year for operations and grants made to third-party organizations. Grants are recognized as expenses in the period during which the transfer is authorized and eligibility criteria are met.

c) Non-financial Assets

Prepaid expenses are non-financial assets that are accounted for as assets because they can be used to provide services in future periods. These assets do not normally provide resources to discharge existing liabilities unless they are sold.

d) Measurement Uncertainty

The preparation of financial statements in accordance with Canadian Public Sector Accounting Standards requires management to make estimates and assumptions that affect the reported

amount of financial assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. These estimates are reviewed periodically, and, as adjustments become necessary, they are reported in the Statement of Operations and Accumulated Surplus in the period in which they become known.

3. Due from the General Revenue Fund

Innovation Saskatchewan's bank account is included in the Consolidated Offset Bank Concentration arrangement for the Government of Saskatchewan. Interest is paid on a quarterly basis at the government's 30-day average interest rate. The average rate for 2014-15 was 0.92% (2013-14 was 1.02%). Interest earned during the year was $95,551 (2013-14 – $140,298).

4. Budget Approval

The 2014-15 budget was approved by the Innovation Saskatchewan Board on October 4, 2013.

5. Related Parties

These financial statements include routine transactions with related parties. Innovation Saskatchewan is related to all Saskatchewan Crown agencies such as ministries, corporations, boards and commissions under the common control of the Government of Saskatchewan. Also, Innovation Saskatchewan is related to non-Crown Corporations and enterprises that the government jointly controls or significantly influences.

Related party transactions to March 31, 2015 include the following:

	(thousands of dollars)	
Expense	2014-15	2013-14
Board of Education of the Saskatoon School Division No. 13 of Saskatchewan	$ 7	$ -
Ministry of Central Services	18	33
University of Saskatchewan	6,221	7,011
SaskTel	18	21
Sylvia Fedoruk Canadian Centre for Nuclear Innovation - Grant	4,000	11,426
University of Regina	400	-
Innovation Place	148	144
Ministry of the Economy	203	212
Accounts Receivable	12	42
Accounts Payable	194	112

Contractual Obligations	*(thousands of dollars)* Leases	Programming
2015-16	148	5,457
2016-17	148	4,148
2017-18	-	3,700
2018-19	-	-
2019-20	-	-
Total	$ 296	$ 13,305

Other transactions with related parties and amounts due to/from them are described separately in the financial statements and the notes thereto.

Routine operating transactions with related parties are recorded at the rates charged by those organizations and are settled on normal trade terms. In addition, Innovation Saskatchewan pays Provincial Sales Tax to the Saskatchewan Ministry of Finance on all its taxable purchases.

6. Financial Instruments

Innovation Saskatchewan's financial instruments include: Due from the General Revenue Fund, Accounts Receivable, Accounts Payable and Accrued Liabilities. The carrying amount of these instruments approximates fair value due to their short-term nature. These instruments have no material interest, credit, liquidity, or market risks.

7. Expense by Object

(thousands of dollars)

Expenses	March 31, 2015	March 31, 2014
Goods and Services	$ 660	$ 833
Grants and Transfers	14,243	20,970
Pension and Benefits	203	212
Salaries	1,241	1,422
Travel	83	148
	$ 16,430	$ 23,585

8. Contractual Obligations

Innovation Saskatchewan has non-related party programming and operational obligations in future years.

	(thousands of dollars)	
	Programming	**Operational**
2015-16	1,241	97
2016-17	141	-
	$ 1,382	$ 97

9. Designated Assets

Innovation Saskatchewan is holding $4.028M as designated assets to be spent as follows:

	(thousands of dollars)	
Designated Assets	**March 31, 2015**	**March 31, 2014**
Nuclear Strategy Program	1,344	6,842
SAIF	2,684	2,340
	$ 4,028	$9,182

Innovation Saskatchewan maintains an internal fund called the Saskatchewan Advantage Innovation Fund (SAIF) for the purposes of providing support for innovation activities in areas such as research and development, demonstration, commercialization and education consistent with the Innovation Saskatchewan mandate. Decisions on projects funded by SAIF are based on a rigorous project evaluation criteria used to vet all projects and are recommended to the Innovation Saskatchewan Board of Directors for approval.

Due to delays in planning and negotiations, Innovation Saskatchewan has retained funds for its Nuclear Strategy Program for purposes of supporting the construction of the Saskatchewan Centre for Innovation in Cyclotron Science (SCI-CS) cyclotron facility and associated nuclear substances laboratory, part of the Sylvia Fedoruk Canadian Centre for Nuclear Innovation and for joint research projects undertaken under the auspices of the Memorandums of Understanding with Hitachi, Ltd. These designated assets are included in the Due from General Revenue Fund on the Statement of Financial Position.

10. Pension Costs

The employees of Innovation Saskatchewan participate in the Public Employees' Pension Plan defined contribution plan. Pension costs of $24,255 (2013-14 - $23,873) are included in pension and benefits expense and comprise the cost of employer contributions for current service of employees during the year. Employer contribution levels are applied at 7.25% of salary. Innovation Saskatchewan's liability is limited to the required contributions.

11. Comparative Figures

Certain comparative figures have been reclassified to conform to the current year's presentation.